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PADLOCK AND KEY CYLINDER RELEASE

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No. OF CLAIMS 4

SPECIFICATION

Padlock and quick change means for the key cylinder and plug of the lock.

Heretofore, the key cylinders of padlocks have been interchangeably mounted in the casing for the padlock by a screw threaded in the key cylinder and casing and accessible through the shallow shackle bore of the casing. The screw is relatively small and the shallow shackle bore is usually drilled to accommodate the screw to be threaded through the bottom of the bore into the key cylinder making it difficult to release the screw. The removal and replacement of key cylinders of padlocks to change the tumbler combination is thus a relatively tedious and time-consuming operation, and the key cylinder can be removed when the shackle is out of its bore regardless of whether the key plug is turned to release the lock.

In accordance with the principles of the present invention, a plunger depressible within a side wall of the key cylinder engages the bottom of a counterbore of a shackle bore to hold the key cylinder to the padlock casing. A washer recessed in the key cylinder and having a retainer formed as a part thereof and extending into a slot in the key plug retains the key plug to the key cylinder. The wall of the key plug prevents depression of the plunger and removal of the key cylinder except when a key has turned the key plug into an unlocked position and registers the slot with the plunger to accommodate the plunger to be depressed within the slot and key cylinder.

An advantage of the present invention, therefore, is in the simplicity of the retainer for retaining the key cylinder to the



locked position in the key cylinder and padlock casing.

Figure 4 is a view somewhat similar to Figure 2 but showing the shackle in an unlocked release position and showing the use of a tool for depressing the locking plunger for the key cylinder; and

Figure 5 is a partial fragmentary sectional view taken substantially along line V-V of Figure 4 illustrating the release of the locking plunger from the padlock casing to accommodate removal of the key cylinder for changing key cylinders.

In the embodiment of the invention illustrated in the drawings, we have shown in Figure 1 a padlock including a casing 10 having a shackle 11 generally U-shaped in form with a key cylinder 12 carrying a key plug 13 on the opposite end of the casing from the shackle. The key plug 13 has a slot for a key 15 opening to the bottom of said key plug.

As shown in Figures 2 and 4, the casing 10 has parallel bores 16 and 17, one of which is deeper than the other, for legs 18 and 19 of the shackle 11. A compression spring 20 seated in the bottom of the bore 16 biases the shackle 11 upwardly out of locking engagement with the casing 10 upon the release of the lock. The leg 18 has an annular recess 21 extending thereabout and adapted to be engaged by a retainer pin 22 for retaining the shackle to the casing when the padlock is unlocked.

The legs 18 and 19 also have arcuate recesses 23 and 24 in the inner sides thereof of different elevations and adapted to be engaged by balls 25 and 26 in a transverse angularly extending passageway 27. The balls 25 and 26 are engaged with the recesses

Referring now in particular to the means for retaining the key cylinder 12 and the key plug 13 to the casing 10, the key cylinder 12 is shown as being generally figure-8 in form and including a solid portion 40, drilled to receive the inner pin parts of tumbler pins (not shown), and as having a hollow portion 41
5 forming a generally cylindrical socket for the key plug 13 carrying said key plug for rotatable movement with respect thereto to lock and unlock the padlock.

The key plug 13 is of a conventional form having a
10 key slot 42 extending therealong and affording access to a series of tumbler pins (not shown) engageable with corresponding spring biased tumbler pins in the solid portion of the key cylinder 12. The key 15 when inserted in the key slot 42 serves to depress the tumbler pins in the solid part of the key cylinder flush with
15 the periphery of the key plug to accommodate turning movement of the key plug relative to the key cylinder, in a manner well known to those skilled in the art and no part of the present invention, so not herein shown or described further.

The key plug has a transverse slot 43 extending there-
20 across adjacent the upper end thereof, registrable with a transverse slot 44 in the wall of the hollow part 41 of the key plug. A semi-circular washer 45 fits in the slot 44 and is provided to retain the key plug to the key cylinder. As shown in Figures 3 and 5, the semi-circular washer 45 has a sector 47 extending into
25 the slot 43 of the key plug, and retaining the key plug to the key cylinder, it being understood that the washer 45 is retained in the key plug by the cylindrical wall of the bored portion of the key

release of the plunger 48 from the bottom 55 of the counterdrilled hole 56.

When, however, the key plug is turned by the key 15 to its unlocked position to position the locking member 28 in the position shown in Figure 4, the key plug 13 will be turned into position to accommodate the stem 51 to pass into the slot 43, as the thin tool 57 is pressed against the end of the plunger 48. With the key 15 in the key slot, the key may exert a withdrawing force on the key plug and key cylinder and thereby withdraw the key cylinder from the lock casing to be replaced by another key cylinder having a different tumbler combination.

It may be seen from the foregoing that a simple release for the key cylinder of a padlock has been provided, accommodating quick removal of the key cylinder to be replaced by a key cylinder having a different tumbler combination by merely unlocking the padlock and withdrawing the short leg of the shackle from its bore 17 and depressing the plunger 48 by a tool 57 until the plunger clears the wall of the bore for the key cylinder, and then withdrawing the key cylinder for replacement with another key cylinder of a different tumbler combination.

Embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In a padlock, a casing, a shackle having a plurality of parallel legs guided in said casing, one of said legs being movable outside of said casing to accommodate opening of the lock, locking means for locking said shackle in a locked condition in said casing, means for releasing said locking means including a key cylinder mounted in said casing, a key plug rotatably carried in said cylinder and operable by turning movement of a key to release said shackle and accommodate one leg thereof to move out of said casing, and means retaining said key cylinder in said casing and accommodating release thereof for changing the key cylinder for a key cylinder having a different tumbler combination, comprising a plunger guided in said key cylinder into locking engagement with said casing, said plunger having an inner reduced diameter stem portion, engageable with said key plug when in a locked position, a spring encircling said stem portion and biasing said plunger into retaining engagement with said casing, and said key plug having a slot therein receiving said stem only when said key plug and the locking means operated thereby are in an unlocked condition, to accommodate depression of said plunger and withdrawal of said key cylinder from said casing.

2. The padlock of claim 1, wherein the slot is in the form of a sector of a circle, wherein a retainer washer is recessed in said key cylinder in alignment with said slot, wherein said washer has a portion extending into said slot to retain said key

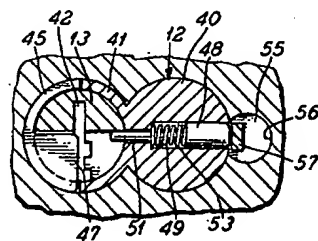
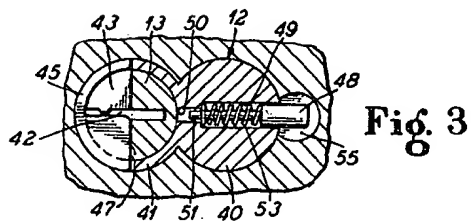
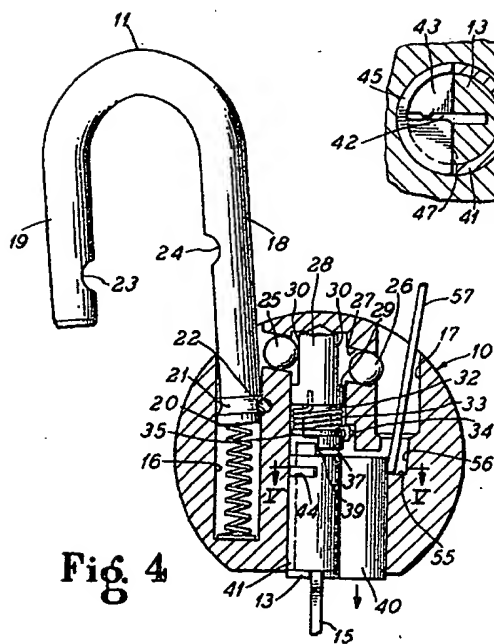
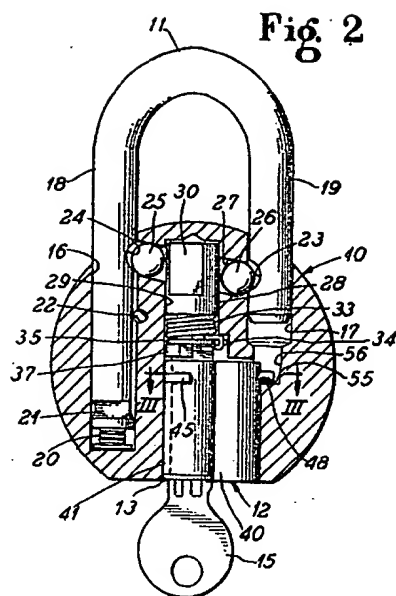
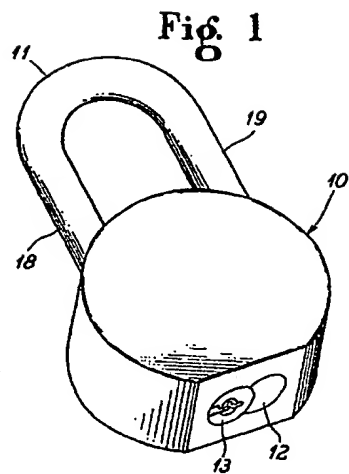
release of said plunger from said counterbore, only when the key plug and locking means operated thereby are in a release position.

4. The padlock of claim 3, wherein the slot is in the form of a sector of a circle, and wherein a retainer washer is recessed in said key cylinder in alignment with said slot and has a quadrant extending in said slot to retain said key plug to said key cylinder, said key plug being movable into position to register said stem portion with said slot, to accommodate a tool to depress said plunger against the bias of said spring when said key plug and the locking means operated thereby is in an unlocked position and permit withdrawal of the key cylinder and plug.



ABSTRACT

Padlock having plunger releasably holding key cylinder to padlock casing and accommodating quick change of the key cylinder. The padlock casing has parallel bores for the shackle, one of which bores is of a lesser depth than the other. The key cylinder is carried in the casing for the lock between the bores and terminates beneath the bottom of the bore of lesser depth. The bore of lesser depth is counterbored to afford access to a plunger guided for movement transversely of the key cylinder and biased outwardly of the key cylinder into the counterbore to hold the key cylinder to the casing. A washer having a quadrant extending inwardly therefrom retains the key plug to the key cylinder. The surface of the key plug intercepts the plunger and prevents depression thereof and release of the key cylinder when the key plug is in a locked condition. A slot for the washer and quadrant affords access of the plunger to the key plug, to be depressed within the slot when the key plug is in an unlocked position. Access is afforded to the outer end of the plunger by a thin screwdriver or other tool upon removal of the short leg of the shackle from its bore.



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